Environment, Health and Safety Division
Integrated Functional Appraisal
of the Chemical Sciences Division

FY 2000

Final Report
16 August, 2000

1.0 Executive Summary

The Environment, Health and Safety Division (EH&S) conducted an Integrated Functional Appraisal of the Chemical Sciences Division (CSD) during the time period May-July, 2000. The Appraisal consisted of initial scope discussions, records review, and inspection of spaces to identify uncontrolled hazards. The inspection team was comprised of technical specialists from EH&S, Department of Energy Berkeley Site Office observer, and the CSD Division Safety Coordinator.

The results of the Appraisal are:

- Training compliance is generally good. Job Hazards Questionnaire and required training completion are greater than 90%.
- Waste compliance steadily improved over the period since the prior Assessment, and stood at 96% as of the most recent inspection.
- Some issues related to inadequate facilities were discovered during the site inspection, but otherwise only minor hazards were discovered.

Overall, the Chemical Sciences Division's safety program effectively controls hazards, and operates with a high level of management support.

2.0 Introduction

The Integrated Functional Appraisal (IFA) is a key component of Lawrence Berkeley National Laboratory's Integrated Safety Management (ISM) system. It is part of Core Function #5 (Continuous Improvement) of the ISM concept, and forms one of the three tiers of reviews to gauge the ongoing effectiveness of Divisions' Integrated Safety Management programs. LBNL's Environment, Health and Safety (ESH) Division has been conducting IFA's of all laboratory organizations since 1996, with each organization reviewed every three years. The Chemical Sciences Division's last IFA was conducted during May and June, 1997.

3.0 Appraisal Process

3.1 Determination of Scope, Preparation for Site Visits

The IFA Team Leader (John Seabury) met with Russell Ellis, the Chemical Science Division's Safety Coordinator, in early 2000. They reviewed the past Division Self-Assessment reports; Management of Environment, Health and Safety (MESH) report; previous IFA report; SAA Compliance Inspection reports;

and the existing Integrated Hazards Assessment (IHA) database entries, developed initially in 1996 and updated during the 1997 IFA process. This review was undertaken to ascertain whether there were problem areas, gross inaccuracies (e.g., researchers had moved, division no longer occupied that space, etc.), or changes. It was determined that the research activities as reflected in the existing recorded information had not changed significantly in the period between the two appraisals although some operations had changed locations. From this discussion emerged a list of operations to be reviewed during the site visits and the principal hazards that might be present.

To assure that the proper spaces were visited, the IFA Team Leader determined what spaces that the Chemical Sciences Division presently occupied (by downloading this information from LBNL's Space Database), and compared that list with the list of spaces occupied during the 1997 IFA. He then updated and developed a list of spaces to visit. The list of spaces was based upon:

- Those spaces occupied by research activities listed as having "Medium" or "High" level of concern hazards;
- Research space (laboratories) occupied subsequent to the 1997 IFA and not included in the existing IFA database; and
- A selection of approximately 10%-15% of other spaces having "Low" or "No" level of concern hazards.

Some spaces assigned to Chemical Sciences Division were not considered for visit. These spaces were:

- Any spaces located on the UC Berkeley Campus (CSD does not maintain any spaces in Donner or Calvin, for which LBNL is responsible; all other UCB spaces are the responsibility of UCB Environment, Health and Safety per Memorandum of Understanding); and
- Spaces located in the Advanced Light Source complex and Building 88 (ALS and Nuclear Sciences, respectively, include these spaces per Memoranda of Understanding);

Spaces chosen for visit included the following:

- Building 70A - Rooms 1129, 1145, 1145A, 1145B, 1149, 1151, 1159A, 1159B, 1165, 1165A, 2203, 2205, 2211, 2215, 2217, 2223, 2229A, 2229B;
- Building 71 - Room 117;
- Trailer 71G - Rooms 101, 102, 103.

3.2 Compliance Records Review

Prior to the site visits, records of Job Hazard Questionnaire completion, required training completion, and waste compliance were reviewed (note: these items are also included in the Division's annual Self-Assessment).

3.3 Appraisal Team

The appraisal team members, and the hazard areas for which each was responsible, were:[1]

John Seabury (EH&S) - Appraisal Team Leader, general safety and industrial hygiene
Linnea Wahl (EH&S) - radiation protection
Ken Barat (EH&S) - laser safety
Michael Prior (CSD) - Chemical Sciences Division Safety Coordinator[2]
Donna Spencer (DOE) - DOE Berkeley Site Office Representative - Observer

Other members of the Chemical Sciences Division staff that participated in the Appraisal included:

Jerome Bucher
Shirley Ebbe
Harvey Gould
Gregory Hair
David Shuh

3.4 Site Visits

Site visits were conducted from May through July, 2000. Each site visit began with an opening conversation with the individual responsible for that space and an explanation of the purpose of the visit. During the visits the team made reference to the standard inspection checklists developed for the IFA process. However, recording was done on the "Hazards, Equipment, and Authorizations Review" data entry sheet that is presently (mid-2000) being implemented. These data entry sheets were turned over to HEAR implementation staff for data input.

Findings from each space were discussed with the person responsible for that space at the time of the inspection.

4.0 Results

4.1 Compliance Records Review

During the records review it was found that training records did not reflect that many CSD employees are assigned full-time to the UC Berkeley campus, and are not required to attend the LBNL class indicated by their Job Hazards Questionnaire. The training records were corrected and compliance is greater than 90% across the Division.[3]

Waste compliance steadily increased during the three years since the last IFA. For the most recent waste compliance inspection the compliance rate was 96%.

4.2 Site Visits

Findings and actions resulting from the site visits are presented in Appendix A. In general, safety conditions under the control of Chemical Sciences Division were well maintained, indicating effectiveness of the Division's Self Assessment inspections. All authorizations (e.g., Radioactive Work Authorizations, Activity Hazard Documents, Satellite Accumulation Areas) were current and compliant. Some deficiencies relating to building services were noted, and those will be referred to Facilities for action.

5.0 Conclusions

The Chemical Sciences Division has excellent management support, excellent overall awareness of safety issues and a safety program that is highly effective at identifying and controlling hazards. The program's effectiveness has been maintained in spite of a complete change in safety management during 2000 (new Division Director, Deputy Division Director, and Safety Coordinator). Some issues relating to the physical facility of Building 70A need to be corrected, and the Division and EH&S will work with Facilities to assure that these are accomplished.

[1] During the initial review process the Division's radioactive, hazardous and mixed waste compliance history was reviewed. It was apparent from the compliance record that no problems existed in this area, so waste issues were not explored during the site visit portion of the IFA.

[2] Russell Ellis was the Division Safety Coordinator until his retirement in March 2000, Michael Prior, Deputy Division Director, assumed the Division Safety Coordinator position at that time.

[3] Although the specific LBNL course requirements do not apply to UCB-based employees, the content requirements do apply in that CSD is required to asure that all employees are properly trained. Within the Job Hazards Questionnaire process there is no way to assure that an employee who has been "waived" from an LBNL course receives and is given credit for the equivalent training acquired elsewhere. Also, there is not a mechanism to automatically remove the "waiver" and trigger the LBNL course requirement if that employee changes location from UCB to LBNL. However, there is not evidence that this has caused any performance of deficiencies, so this is a subject for perhaps future CSD safety program consideration.

Appendix A
Findings: Chemical Sciences Division
Integrated Functional Appraisal 2000

Building	*Room*	*Finding*	*Action*
70A	1129	A gas cylinder had been tagged (#3749) as needing a pressure relief valve during the Division's Self Assessment in January, 2000 but this had not been installed as of May, 2000.	CSD will install.
	1145	An X-ray source did not have a current X-ray authorization; this source is not in use and the new authorization is in progress.	CSD will continue to work with EH&S to have authorization completed.
	1145B	Lead Oxide is present on bricks. This project is ongoing, a finding but not a deficiency.	CSD will decide upon the final configuration of the lead shielding and install an encasement around the bricks.
	1149	Hand pipetting is performed, although infrequently.	If frequency of pipetting increases CSD will contact EH&S to assess whether more ergonomically friendly equipment should be acquired.
	1165A	"Sealed Source" signs are outdated	CSD to contact EH&S for new signs
	2203	Hand-held drench hose installed near the exit door does not meet standards for eyewash units. Unit must be replaced with a fixed, dual-head unit, and moved so that it is not near the electrical breaker panel.	This is a Facilities issue. A facility-wide eyewash/safety shower project is in progress, and this location has been included. EH&S will monitor.
	2205	There are no provisions for eyewash in this laboratory.	This is part of the facility-wide eyewash/safety shower project for Room 2203.
	2211	There is a telephone and network panel that is inside of the laboratory. This location requires that crafts-persons enter the lab to perform work.	CSD will submit a work request to Facilities to move the panel into the hall. Identify this as a Facility Deficiency issue.

		Personnel and environmental contamination from nearby radioactive materials could result.	
		There is a fire extinguisher that has not been inspected in over a year.	EH&S notified LBNL-Fire Department to inspect.
		Southwest corner of laboratory - access to electrical panels is blocked.	CSD will follow up to assure that they have been cleared.
		Distillation hood - the hood sashes are constructed of clear plastic. These sashes, and all parts of the hood, must be constructed of non-combustible materials. Diethyl ether, toluene, and tetrahydrofuran are distilled in this hood.	CSD will follow up for correction.
		Magnetic field strength of the Nuclear Magnetic Resonance Spectrometer should be measured to determine if a hazard exists.	EH&S measured field strengths in July 2000 and posted the area.
	2217	Eyewash and safety shower need to be upgraded to present standard and moved away from electrical panels.	EH&S will follow up, add this unit to the overall facility deficiency list for correction.
		Paint is peeling from the walls. This may pose a lead hazard.	CSD will issue a Work Request to assess and remove peeling paint as a safety issue.
		There is a Class D fire extinguisher that needs to be inspected.	EH&S has notified LBNL-fire.
		The electrical panel located near the exit door is blocked and must remain accessible.	CSD will clear the panel.
	2223	There is general clutter and excessive boxes of computer-related stuff piled in the middle of the laboratory, creating an impediment to emergency exit.	CSD will remove the material.
71	117	There are numerous electrical power and signal cords coiled or laid across the floor, forming tripping hazards.	CSD will rearrange the cords into the overhead cable trays.
71G	103	There is a flammable materials storage cabinet located in the break room immediately near the coffee maker. Chemicals should not be stored in eating areas, and in addition the cabinet should not be near a source of ignition.	CSD will relocate cabinet, possibly to Room 102.